EFFEKTA®
USV-Anlagen DC/AC-Wechselrichter DC-USV-Anlagen

UPS

Uninterruptible Power Supply

ME 400/500/600/650/800

Instruction Manual

Item number:

ACX11MES40000000 USB
ACX11MES50000000 USB
ACX11MES60000000 USB
ACX11MES65000000 USB
ACX11MES80000000 USB

Juni 2008

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1 Presentation

In this instruction manual, the abbreviation UPS stands for Uninterruptible Power Supply.
The following pictograms are used in this instruction manual:

Denotes information which, if disregarded, poses a risk to health, functionality or safety.

Warning about the handling of batteries.

Warning about dangerous electrical voltage.

Denotes additional information and tips.

Recycling symbol.

Denotes components that are governed by the electronic scrap ordinance.

Denotes components or parts that must be disposed of in a specific manner. Never throw these components into the regular refuse.

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We reserve the right to make technical and visual changes, and we are not liable for typographical errors.

2 Warranty conditions

The delivery receipt is considered to be the initial proof of purchase and should be stored carefully. It is required for all warranty claims. If the product is transferred to another user, then the latter is entitled to claim under the warranty for the remainder of the warranty period. The purchase receipt and this declaration should be transferred to the possession of the new owner.

We guarantee that this equipment is in a functional state and corresponds in technical terms to the descriptions in the enclosed documentation.

The warranty period for special equipment corresponds to the minimum period prescribed by legislation.

This warranty is not valid for the following cases:

- Defects due to: damage during transportation, accidents, natural disasters, misuse, vandalism, inappropriate use, maintenance errors or incorrect repairs by third parties.
- Modifications, unauthorised tampering, incorrect operation, another device or accessory, incorrect installation, or any modification not approved by us.
- Disregard for the instructions in the supplied documentation.
- Incompatibility of the product as a result of technical innovations or regulations that may come into effect after the purchase.
- Incompatibility or malfunction caused by product components not used by us.
- Signs associated with the normal ageing process of the product (wearing parts).
- Defects caused by external appliances.

The warranty period for parts replaced and/or repaired within the scope of this warranty expires with the original warranty for the product.

Equipment sent in without accessories will be replaced without accessories. Equipment returned will only be accepted if it is returned in the original packaging.

All incidental transportation costs are excluded from the provisions of the warranty.

EFFEKTA GmbH does not give any express or implied warranties in relation to this equipment and its quality, performance, merchantability or suitability for a specific purpose. In some countries, the exclusion of implied warranties is not permitted by law. In this case, the validity of all express and implied warranties is restricted to the warranty period. When this period expires, all warranties cease to be valid. In some countries, a limitation of the validity period of implied warranties is not permitted by law, in which case the above restriction is not effective.

2.1 Limitation of liability

Compensation claims are excluded unless they are based on deliberate acts or gross negligence of EFFEKTA GmbH or its employees. Liability under the Product Liability Act remains unaffected. Under no circumstances will we be held liable for:

- Claims for losses or damage made by third parties against you.
- Loss of or damage to your records or data or the cost of their recovery.
- Financial consequential damage (including loss of earnings or savings) or incidental damage, even in the event that we were informed of the possibility of such damage.

Under no circumstances whatsoever will EFFEKTA GmbH be held responsible for any coincidental, indirect, special, consequential or other damage of any kind (including, without limitation, damage relating to loss of profit, discontinuation of business, loss of business information or any other loss) arising from use of the equipment or in any connection with the equipment, whether based on a contract, compensation, negligence, strict liability, or other claims, even if EFFEKTA GmbH was informed in advance about the possibility of such damage. This exclusion also applies for any liability arising from claims of third parties against the initial purchaser.

In some countries, the exclusion or limitation of coincidental or consequential damage is not legally permitted, in which case the above declaration is not effective.

3 Safety

3.1 General safety instructions

Read and observe the user manual and safety instructions in this chapter before taking any further action (transportation, storage, connection, startup etc.).

Since the UPS equipment uses mains voltage and has a suitable energy accumulator (high-capacity batteries) installed either inside or outside the device, the instructions in this chapter are very important for all users and personnel. For this reason, appropriate safety instructions on the topic of batteries and battery packs are also dealt with here.

Work on the UPS equipment may only be performed by authorised technical personnel.

3.2 Transportation and storage

The UPS may only be transported to its place of intended use in the original packaging. The same applies for removals or returns.

The equipment must not be transported or stored upside down.

Position the equipment securely during transportation, taking its centre of gravity into account. Due to its weight, UPS equipment with integrated batteries may drop suddenly if its position shifts slightly.

When storing equipment, make sure that it is also securely positioned.

3.3 Setup

The UPS is intended for use in ventilated rooms.

During setup or installation, the installation location prescribed by the manufacturer must be observed.

There is a risk of condensation where the UPS is exposed to extreme and rapid temperature changes. Before taking any further steps, the equipment should be allowed to acclimatise for at least 2 hours.

Never set up or operate the equipment in a damp environment.
Keep fluids away from the equipment.

The UPS must not be set up near heat sources.

Ensure that the vents of the equipment are not blocked and that the circulation of air is not impeded.

3.4 Connection

Only connect the UPS to an earthed shock-proof socket. Under no circumstances should the equipment be operated without a protective earth conductor.

The house installation socket must be easily accessible and located in the vicinity of the UPS. In the case of a fixed connection, ensure that the shortest possible cable lengths are used.

Only a VDE-tested and CE-labelled mains cable may be used to connect the UPS to the house installation socket. In the case of a fixed connection, a suitable cable must be used.

Only use VDE-tested and CE-labelled electrical cables to connect the consumer load to the UPS. In the case of a fixed connection to the consumer load, a suitable cable must be used.

The fuse protection for the consumer load must always be installed directly in front of it, and never centrally in front of the UPS.

Do not operate any household appliances and power tools, e.g. fan heaters, vacuum cleaners, drills, hairdryers, toasters etc., via the UPS.

Do not connect any consumer loads to the UPS which could overload the equipment (e.g. laser printers).

The sum of the earth fault currents of all consumer loads connected to the UPS must not exceed 3.5mA.

Keep the connecting cables as short as possible and always lay these correctly. Avoid the dangers of laying connecting cables in locations where they may be tripped over, crushed or torn open etc.

3.5 Operation

The mains power cable must never be disconnected during the operation of the UPS, otherwise the protective earthing of the UPS and the connected consumer loads will be lost.

The UPS equipment contains an energy accumulator (batteries). This means that the output of the UPS may be live even if it is not connected on the line side.

To switch off the UPS completely, first press the switch on the front of the equipment (ON/OFF), wait until the UPS has switched off, then disconnect the

power supply (switch off the mains input externally or disconnect the UPS from the mains, e.g. by unplugging it).

Make sure that no fluids or foreign bodies enter the UPS.

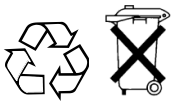
3.6 Handling batteries

Warning – danger of electric shocks and burns.
Batteries can cause electric shocks and are capable of producing high short-circuit currents which can also inflict burns.

Unauthorised persons must be kept away from batteries.

Do not place batteries against heat sources and do not throw them into a fire as they might explode!

Do not open or destroy batteries. The electrolyte thereby released is extremely dangerous to persons and to the environment (danger of chemical burns to skin and eyes, toxic).



Defective batteries must be disposed of in an environmentally-friendly manner.

Never throw batteries into the regular refuse.

The local waste disposal regulations must be observed.

3.7 Maintenance, servicing and faults

Warning – danger of electric shocks.
The UPS remains connected to the battery circuit even after it has been disconnected from the mains power supply and has a dangerous voltage potential. Therefore always disconnect the battery circuit before carrying out servicing or maintenance work and make sure that the equipment is isolated from the supply.

Work on batteries may only be performed and monitored by personnel with appropriate technical knowledge about the required precautions.

Unauthorised persons must be kept away from batteries.

When working on the UPS, the following precautions must be taken:

- Remove wristwatches, rings and other metallic objects
- Only use electrically-insulated tools

The UPS must not be dismantled.

4 Introduction

This manual is intended to provide basic information about single-phase line interactive UPS equipment, namely the functional principle, use of the various functions and the procedure to follow in the event of faults. In addition, this manual contains information on transportation and storage as well as handling and installation of the UPS equipment.
The planning guidelines in this manual relate only to the specific requirements for UPS equipment. The national and local regulations for electrical installations must be followed without fail during installation.
The contents of the description for this equipment may change as a result of technological developments. Though we have endeavoured to make these contents as accurate and clear as possible, we would be grateful for information on any errors which are noted.
We accept no liability for errors in this description or their consequences.

The purpose of UPS (Uninterruptible Power Supply) equipment is to protect sensitive electrical devices such as computers, workstations, electronic points of sale, mission-critical instruments, telecommunications equipment, process controls etc. from faults which may arise as a result of poor power supply quality or even power failures. Sensitive devices such as these require comprehensive protection against electrical faults. These may be external faults (e.g. bad weather, operating faults) or faults caused by adjacent devices (e.g. motors, air conditioning units, processing machines, welding equipment etc.). The power supply faults may be summarised as follows:

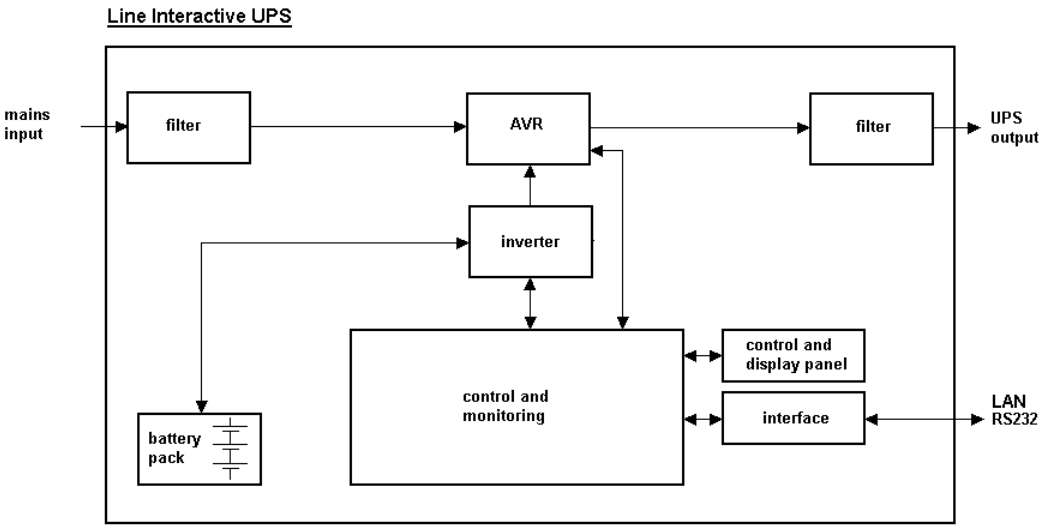
- Fast and slow line-voltage spikes and fluctuations;
- Mains power failure;
- Fast and slow frequency spikes and fluctuations;
- Mains heterodyning or transient voltages.

The UPS equipment monitors the power supply parameters described above using suitable countermeasures to protect the connected users (e.g. changeover to support operation in the event of temporary over- or under-voltage to protect the end devices).

5 System description

The UPS supplies an uninterrupted, single-phase voltage to users with mission-critical applications. In addition to supplying consumer loads, the equipment also keeps its internal batteries in a fully charged state. In the event of a power failure or power fault (e.g. voltage fluctuation), the UPS continues, without interruption, to deliver a modified sine-wave voltage supply to the UPS output. In support mode, the energy is drawn from the battery pack.

Fig. 1:
Block diagram
ME series



The block circuit diagram shows the individual modules of the equipment and provides a general impression of how they interact.

If the mains power failure exceeds the bridging time of the UPS, it shuts down to prevent deep discharging of the batteries (sleep mode). When the mains power supply is restored, the UPS restarts automatically, supplies the consumer loads and controls the charging of the battery pack.

6 Description of equipment – ME series

In this chapter, you will be introduced to the various elements of the equipment and will be provided with instructions on its operation as well as all information on equipment connections.

6.1 Display and operator control elements on the front panel

Fig. 2:
Front view
ME series

All of the operator control and display elements required for normal operation are positioned on the front of the equipment.

6.1.1 Warning, indicator and o

All of the indicat n are grouped together on this panel. All in equipment is available at a glance (Fig.3) . In additional, various different audible alarm notifications are presented.

6.1.2 Operator control elements of the UPS

Fig. 3:
Display and operator control panel
ME series

UPS “ON/OFF” switch:
When the UPS is powered down, it can be switched on using this switch. When switching on without a power supply (DC start), the connected load should not exceed 80% of the specified maximum load.

Hinweis

Providing the mains power supply remains on via the fuse (positioned at the rear of the UPS), the charging unit also continues to operate even after the UPS has been switched off.

6.1.3 Display elements of the UPS

Hinweis

In general, all display elements only become active when the UPS is powered up.

Line mode LED: (five-fold function)

a) If mains power is available, the LED lights continuously.

b) In charging mode the LED flashes every 0.5 seconds

c) In the event of a device fault, the LED flashes every three seconds and the alarm sounds continuously

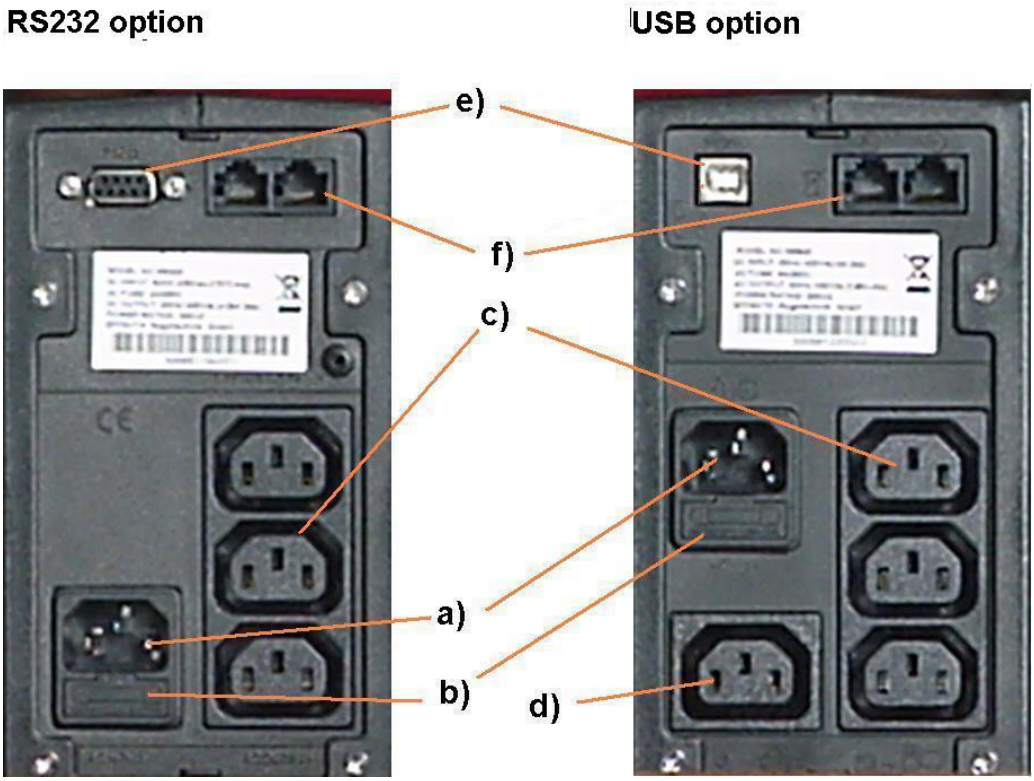
d) In battery mode the LED flashes and the alarm sounds every three seconds. When the low battery threshold is reached the LED flashes and the alarm sounds every 0.5 seconds.

e) In the event of an overload the LED lights continuously and the alarm emits a constant signal.

Battery error LED:
The LED lights up in the event of a battery error. The battery should be checked and exchanged if necessary.

6.2 Equipment elements on the rear panel

Fig. 4:
Rear view
ME series



Danger!
All plug connections on the rear panel (with the exception of the communication interface) are on the mains power potential when connected.
Even when disconnected, dangerously high voltages may be present at the plug connections as a result of charged capacities inside the equipment.

a) Mains input 10A IEC plug for mains voltage.

The protective earth conductor must always be connected!
Please always observe the input voltage shown on the identification label or in the technical data of this manual.

b) Fuse for mains input:
The mains input is enabled when the fuse is inserted. The fuse is triggered in the event of high overcurrents or an equipment defect (e.g. internal short-circuit) and the device is immediately disconnected from the connected mains power supply.
To simulate a mains power failure, simply remove the fuse or disconnect the plug connection for the mains power supply.

Hinweis

If all UPS connections have been established and the fuse has been inserted, the charging unit automatically becomes active, i.e. charging of the internal battery pack is already underway, without having to start the UPS.

c) UPS output — 10A IEC socket (IEC320)
Output with power failure protection.

d) UPS output — 10A IEC socket (IEC320)
Output without power failure protection. The output only provides protection against excessive voltage from the mains power supply.

Hinweis

The protective earth conductor must always be connected!
Please always observe the max. possible power output of the equipment indicated on the identification label or in the technical data of this manual.

e) Communication (9-pin D-Sub socket or USB) — All of the relevant UPS data are transmitted to an appropriate primary control unit (e.g. PC) via the serial interface (RS232 or USB). Suitable software packages are available for this (see Software chapter).

f) Over-voltage protection for network or telephone (RJ11, RJ45) — RJ11 / RJ45 socket.

Identification — The identification label contains information about the:

- Manufacturer
- Equipment model and output class
- Equipment input values
- Equipment output values
- Item number
- Serial number
- CE and barcode designation

6.3 Audible alarm signals of the UPS

Support mode and high battery capacity:
The audible warning notification sounds in the following sequence (**A**)
[beep, beep -> long pause (3 s) -> beep, beep -> ..., repeating].

Support mode and low battery capacity:
The audible warning notification sounds in the following sequence (**B**)
[beep, beep -> short pause (0.5 s) -> beep, beep -> ..., repeating].

Operating fault or overload:
The audible warning notification sounds with a continuous tone, sequence (**C**)
[Beeeeeeeeeeeee....p].

7 Storage and unpacking

7.1 Storing the UPS

If the equipment is not installed immediately, the following should be observed:

- The equipment and accessories must always be left in the original packaging and stored.
- The recommended ambient storage temperatures are: +5°C...+30°C.
- Protect the equipment and its packaging from moisture.
- If the storage period is likely to be longer than 4 months, the UPS must be brought into operation for approx. 8 hours to prevent deep discharge of the batteries.

7.2 Unpacking the equipment

Remove the shipping cartons and packaging material. Always store the equipment horizontally and never upside down.

Check the shipping note to make sure that the delivery is complete. If the delivery is incomplete or incorrect, inform the supplier immediately.

You should also check the delivery for transit damage. Any claims for transit damage must be made immediately:

- Retain the all shipping cartons and packaging material for verification purposes.
- Immediately inform the manufacturer or your supplier.
- Immediately inform the shipping company.

8 Installing and connecting the UPS

All requirements in the technical data regarding environmental and operating conditions must be observed to ensure trouble-free functioning of the UPS.

The following must be observed when setting up / installing the UPS equipment:

- Avoid extremes of temperature and atmospheric humidity. A maximum service life, particularly in relation to the batteries, is achieved at an ambient temperature of 15-25°C.
- Always ensure sufficient space behind the UPS to be able to perform the necessary connections there. The load-bearing capacity of the support must be sufficient.
- Observe the specified installation position. The specified installation position is upright vertical only.
- Make sure that ventilation of the equipment is possible at all times. Therefore a minimum clearance of at least 50mm must be observed on the right, left and at the rear of the UPS. Ensure an appropriate flow channel.
- Make sure the equipment is arranged correctly. When installed in parent systems (e.g. machine, control cabinet), it must be ensured that the UPS operates within the specified temperature range. A sufficient level of forced ventilation must exist to remove excess heat that builds up in the space where the UPS is installed.

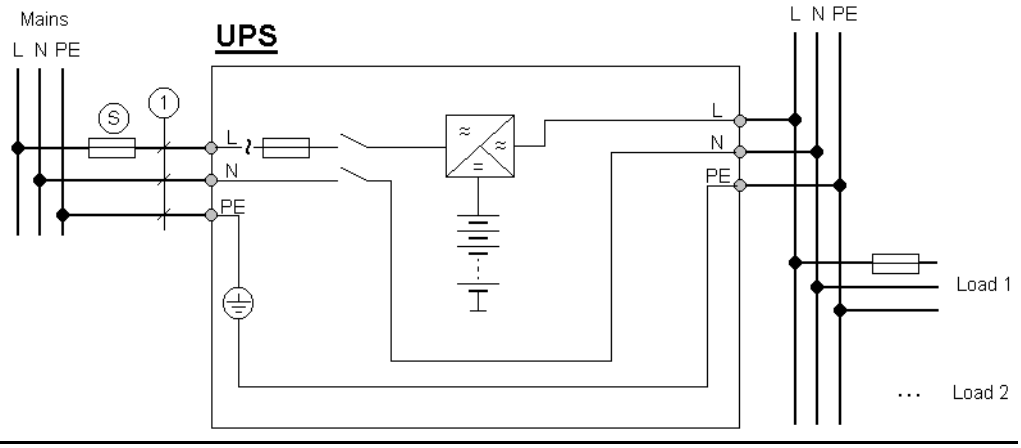
8.1 Connecting the equipment

8.2 Connecting the UPS

The model is equipped with plug-type connections. The connection diagram (Fig. 5) and the following information must be observed:

Fig. 5:
Connection of UPS and consumers

ME series	
S:	10A
1:	0.75 mm²



Warning
The UPS equipment contains components with high voltage and amperage. Incorrect handling may therefore result in electrical accidents which may have fatal consequences or cause material damage.

The protective earth conductor must always be connected! If not, the consumer loads will also not be earthed.

Warning
The connection diagram shown in Fig. 5 only applies if:

- the loop resistance is complied with up to the last consumer load;
- the earthing of the consumer loads is ensured;
- or that the consumer loads are separately protected against overcurrents and leakage currents, and are also earthed.

Hinweis

Please note that if the UPS equipment is in an emergency OFF circuit and this is activated, power will still be supplied to the UPS output. The consumer loads will continue to be supplied for the duration of the support time.

8.3 Connection sequence

Connect the UPS to the mains making sure that the mains and UPS are safely switched off beforehand.

Connect the consumer load(s) to the UPS. Ensure that all consumer loads are switched off.

Connect the communication port with your host computer using the cable supplied.

9 Operating and controlling the equipment

9.1 Operating the UPS equipment

The operation of this equipment is indicated by various operating modes and signals.

9.1.1 Operating modes and signals

The most important operating modes of the UPS are:

Charging mode:
If the mains power is available and the line-side fuse is switched on, UPS charging mode is enabled.
-> The batteries are already charged, but the UPS has not yet been switched on.

Display/alarm signal: since the UPS has not yet been switched on, there are no indicators or warning messages in this operating mode.

Startup mode:
If the mains power is available, the startup procedure is initiated when the "ON/OFF" switch on the front of the equipment is pressed, then on-line mode is automatically activated.
If no mains power is available during the startup procedure, the UPS switches directly to support mode following the startup procedure.

Display/alarm signal: the starting response is indicated by flashing of the display LEDs.

On-line mode:
If mains power is available and the UPS has completed the startup procedure, on-line mode is automatically activated.
-> If necessary, the battery pack is charged in this operating mode.

Display/alarm signal: in on-line mode the line LED lights constantly. The line LED flashes every 0.5 seconds when the charging unit is active. No audible alarm signal.

A.V.R. mode:
Within certain limits, A.V.R. mode compensates for over- or under-voltage in the power supply without drawing current from the batteries. This reduces the transfer voltage range at the UPS output compared to the mains power supply.

Display/alarm signal: A.V.R. mode has no special display. The display is the same as on-line mode. No audible alarm signal.

Support mode (battery mode):
If the mains power fails, the UPS immediately switches to support mode. If the voltage falls below the cut-off voltage of the battery pack, the load is automatically switched off and switched to sleep mode.

*Display/alarm signal: In support mode the LINE LED flashes. The audible alarm signal sounds with sequence (**A**).*

Overload mode:
If the UPS output is overloaded, the UPS switches off after a short time interval (approx. 5 seconds). The UPS switches off immediately in the event of a short circuit on the output side.

*Display/alarm signal: In overload mode the LINE LED lights up. The audible alarm signal sounds with sequence (**C**).*

Sleep mode:
The UPS switches to sleep mode when it is switched off via the communication interface or if the voltage falls below the cut-off voltage of the battery pack in support mode. In this event the UPS only monitors the input supply for resumption of power supply.

Display/alarm signal: No display. No audible alarm signal.

Fault mode:
If a fault develops in the equipment, the UPS immediately switches to fault mode. This switches off the load at the output. This operating mode can then only be reset by powering down the UPS completely.

*Display/alarm signal: In fault mode the LINE LED lights up. The audible alarm signal sounds with sequence (**C**).*

9.2 Instructions for using the UPS

The operator of this UPS equipment must always comply with the instructions in this manual. The operator may only carry out the following and must exercise extreme care when doing so:

- Use of the operator control elements: Switching the UPS on and off.
- Reading the display elements and interpretation of the audible alarm signals.
- Use of communications interface, whereby a connection to the PC or other systems must already exist for UPS equipment with a fixed connection.

Owing to the comprehensive protection functions which the UPS equipment assures in relation to the user(s), the UPS runs completely autonomously. Only the switching-on and switching-off is performed by the operator. In addition, data can be exchanged via the communications interface but this is not absolutely necessary for the general operation of the equipment.

9.2.1 Switching on the UPS

To switch the UPS on, press the “ON/OFF” on the front of the UPS.
The UPS selects the appropriate operating mode upon completion of the startup procedure.

9.2.2 Switching off the UPS

The UPS is switched off using the “ON/OFF” switch.
The UPS remains in charging mode to keep the batteries fully charged and ready for operation.
To shut down the UPS equipment completely, the equipment must be disconnected from the mains by pulling out the feeder cable.

The UPS can only be fully deactivated by disconnecting it completely from the mains power supply.

9.2.3 Communication

Software packages are required to facilitate the exchange of data between the UPS and a parent system. The range of features can be found in the “Software” chapter.

10 Starting up the UPS equipment

To guarantee error-free startup, the following actions must be carried out:

1. Check the line-side fuse then connect the equipment to the power supply.
2. Switch the UPS on (switch on the front of the equipment).
3. Wait until the UPS is in on-line mode.
4. Now connect the consumer loads one by one, observing the load indicator. (Software)

Hinweis

If all of the steps have been completed successfully, the UPS will be in on-line mode and the load must be less than 100%.

5. Now switch the system off (switch on the front of the equipment).
6. Wait a few seconds (“refresh”).
7. Switch the UPS back on (switch on the front of the equipment).

Hinweis

The UPS equipment should revert to on-line mode after a few seconds. This test ensures that the system will also start when the total load is connected.

Following this a power failure can be simulated by unplugging the mains power supply. Here, too, the UPS must be able to operate the load without overloading.

If the outcome of this test is positive, the system can remain in this status ready for operation. Otherwise, the load at the output of the UPS must be reduced and the system must be brought back into operation.

11 Troubleshooting

Troubleshooting on the UPS equipment may only be performed by authorised technical personnel.

If the UPS does not work properly, try to resolve the problem by referring to the following table:

Problem:	Possible cause:	Remedy:
The UPS cannot be started and no alarm signal is given.	**Mains power is not available to the UPS or is switched off.**	**Ensure that all connections have been established and verify this by means of appropriate voltage measurements. Check the line-side fuse for the UPS.**
	The batteries are deep-discharged or defective.	**Remove batteries from the UPS and charge externally or replace.**
The UPS is in overload mode, the overload indicator is illuminated, and an audible warning notification sounds (sequence (C)).	**The consumer load(s) are overloading the UPS.**	**Remove the consumer or some of the consumers from the UPS.**
The bridging time is less than the rated value.	**The batteries are not fully charged, or individual batteries are defective.**	**Charge the batteries for more than 8 hours and repeat the test. If the problem persists, the batteries must be replaced.**
The UPS appears to be OK, but the consumer load is not operating.	**The connection between the UPS and the consumer load is defective.**	**Check the connection and confirm it by measuring the voltage.**

If the fault profile you are experiencing with your UPS is not described in the above table, inform our service department making sure you have the following information to hand:

1. Model number, serial number
2. Date on which the problem occurred
3. Detailed description of the problem

12 Software

The settings and operating statuses of the UPS can be determined and processed further using the communications interface in combination with a suitable software package. The software packages may be obtained from the manufacturer / dealer or via the service hotline (see “Service” chapter) where you can obtain useful information about suitable software packages for your application and UPS. For more information, you can also visit our Internet home page:

http://www.effekta.com/

The following basic functions are supported by all software packages:

- Detection and display of the UPS mains power status;
- Display of the UPS output status;
- Detection and display of the battery pack charge status;
- Closing down of running applications in the event of a mains power failure;
- Shutdown of the operating system;
- Creation of log files;
- General monitoring of UPS data and status (diagnosis function).

For more details on individual software packages – such as information on installation, operation and the range of features – please consult the software manual.

Hinweis

You will find a suitable tried-and-tested software package in the “Accessories” chapter.

13 Maintenance and servicing

You can expect a long service life and trouble-free operation from your UPS equipment as long as you ensure that the necessary minimum level of maintenance is carried out. However, the reliability of the UPS is also significantly affected by environmental conditions. The temperature and atmospheric humidity of the surroundings must be kept within the limits. In addition, the area around the UPS must be kept as clean and free of dust as possible. At the ideal ambient temperature of 22°C, the typical service life of the batteries is approx. 4 years, but this service life can be substantially increased (to approx. 8-10 years) by using special batteries.

You should check at regular intervals (every 6-12 months) to ensure that the remaining bridging time is sufficient for your intended purposes. If this is not the case, then it is time to replace the batteries.

13.1 Measuring the bridging time (support time)

Before starting this procedure, it is absolutely essential to save all open data. Also inform all employees concerned.

There are essentially two methods of measuring the support time. Method a) is suitable for measuring the actual support time, whereby the consumer loads will inevitably have zero current at the end of the bridging time.
Method b) enables the residual capacity to be determined after a specific support time, whereby consumer loads will not generally be left with zero current.

To apply one of the named methods, force the UPS into support mode by switching off the mains power supply.

After performing the measurement, switch the mains power supply back on and start the UPS as normal using the main switch.

Bear in mind that after the measurement the batteries will be discharged, i.e. the on-line/charging mode must have been active in the UPS equipment for several hours (min. 5 hours) before they are approx. 80% operational again.

If the support time is not measured due to local conditions or directives, we recommend replacing the batteries every two years as a preventive measure to avoid the risk of inadequate support time due to battery deterioration.

13.2 Service log

Enter all maintenance and servicing work performed on the UPS equipment into the service log.

Date:	Work carried out:	Carried out by:

13.3 Service hotline

In the unfortunate event that problems occur with the UPS or if you require safety-relevant information, please contact our service hotline on the following phone or fax numbers:

Tel. no.: 0049 / (0) 741 –17451-0

Fax no.: 0049 / (0) 741– 17451-29

If it is not possible for you to get in touch by telephone, we have set up an e-mail contact address for you:

ups@effekta.com

In addition, you can contact the department or subsidiary you need directly via the following Internet address:

http://www.effekta.com/html/kontakt.html

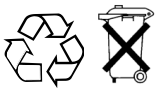
13.4 Maintenance and service contracts

EFFEKTA Regeltechnik GmbH offers you tailored maintenance and customer services that ensure the highest possible reliability and availability of your UPS equipment.
In addition, as part of a maintenance contract, our expert technical personnel can provide you with support in the following areas:

- Regular checking of the equipment, especially the batteries, as well as timely replacement and disposal of batteries;

- Checking of the UPS installation;

- Disposal of defective or deteriorated components;



- Environmentally-friendly disposal of batteries.

Our entire range of services is presented at:

http://www.effekta.com/html/service.html

or alternatively, you may contact us directly at the above addresses.

14 Technical Data

14.1 Equipment specifications

Model:		ME400	ME500	ME600	ME650
Power:		400VA / 225W	500VA / 250W	600VA / 300W	650VA / 325W
Mains power input:	Phases	1 phase conductor + neutral conductor			
	Input range	170-280V AC			
	Rated frequency	50 / 60Hz			
	Synchronous range	45-65Hz			
	Boost (+13%)	yes			
	Buck (-13%)	yes			
UPS output:	Rated voltage (support mode)	230V AC (modified sine +/-15%)			
	Max. output current	1.7A	2.1A	2.6A	2.8A
	Bridging time	6 min.	6 min.	4 min.	4 min.
Efficiency:	AC -> AC	> 94%			
DC input	Input voltage	12V DC (rated)			
Interface:	LAN / RS232	9-pin D-SUB socket or USB (galvanically isolated)			
Environmental data:	Perm. temp. range	0...+40°C			
	Recommended temp.	+15...+25°C			
	Storage temperature	0...+40°C			
	Rel. atmos. humidity	0...90% (non-condensing)			
Standards:		EN 50091-1, EN 50091-2			
General	Cooling	Convection cooling without fans			
	Noise level	<35dB			
	Weight	5.4kg	5.8kg	5.8kg	5.8kg
	Inspections	TÜV / GS / CE			
Dimensions	H x B x D [mm]	171 x 95 x 357mm			

Model:		ME800
Power:		800VA / 425W
Mains power input:	Phases	1 phase conductor + neutral conductor
	Input range	170-280V AC
	Rated frequency	50 / 60Hz
	Synchronous range	45-65Hz
	Boost (+13%)	yes
	Buck (-13%)	yes
UPS output:	Rated voltage (support mode)	230V AC (modified sine +/-10%)
	Max. output current	3.5A
	Bridging time	3 min.
Efficiency:	AC -> AC	>94%
DC input	Input voltage	12V DC (rated)
Interface:	LAN / RS232	9-pin D-SUB socket or USB (galvanically isolated)
Environmental data:	Perm. temp. range	0...+40°C
	Recommended temp.	+15...+25°C
	Storage temperature	0...+40°C
	Rel. atmos. humidity	0...90% (non-condensing)
Standards:		EN 50091-1, EN 50091-2
General	Cooling	Convection cooling without fans
	Noise level	<35dB
	Weight	6.4kg
	Inspections	TÜV / GS / CE
Dimensions	H x B x D [mm]	171 x 95 x 357mm

14.2 Accessories

Below is a list of components that have been specifically tested and approved for this UPS by EFFEKTA Regeltechnik GmbH:

Accessory:	Function:	Item number:
Software package “UPSILON 2000”	Shutdown and diagnosis software	UPSILON 2000

14.3 List of wearing parts

The following components are subject to normal wear and tear and are therefore not covered by the warranty for this UPS:

Wearing part:	**Function:**	**Item number:**
XXXX XX XX ** Battery 12V 7Ah	ME400, ME500, ME600, ME650 energy accumulator	Depending on equipment; see accessories or on request
XXXX XX XX ** Battery 12V 9.5Ah	ME800 energy accumulator	Depending on equipment; see accessories or on request

** For wearing parts designation, see fitted batteries. This can also be obtained on request.

15 Requirements for the declaration of conformity

The CE-labelled UPS equipment complies with the following harmonised standards and EC guidelines:

EC guideline:	73/23/EEC (for devices operating within a restricted voltage range) 93/&(EEC – supplement to guideline 73/23/EEC 89/336/EEC – guideline on electromagnetic compatibility 92/31/EEC – supplement to EMC guideline 89/336/EEC
Standards:	EN 50091-1 EN 50091-2

An EC declaration of conformity for CE-labelled products may be obtained on request from the following address:

EFFEKTA Regeltechnik GmbH
Rheinwaldstr. 34
78628 Rottweil, Germany

Tel. no.: 0049 / (0) 741–17451-0